

SEQUENCE LISTING

<110> KYOWA HAKKO KOGYO CO., LTD.

<120> F<sub>0</sub>F<sub>1</sub>-ATPase polypeptides and their genes

<130> 11329US1

<150> JP 2000-234317

<151> 2000-08-02

<160> 21

<170> PatentIn version 2.1

<210> 1

<211> 304

<212> PRT

<213> Corynebacterium ammoniagenes

<400> 1

Met Cys Asp Gly Val Arg Ser Cys Asp Arg Glu Phe Glu Thr Ser Ile  
1 5 10 15

Ala Pro Tyr Asp Val Asp Asn Arg Thr Ala Arg Thr Arg Glu Arg Thr  
20 25 30

Leu Ser Val Thr Thr Leu Ala Met Lys Gly Ser Phe His Ala Pro Glu  
35 40 45

Leu Asp Pro Glu Phe Phe Pro Gly Gln Tyr Tyr Gly Asp Ile Leu Phe  
50 55 60

Asp Asp Val Leu Gly Gly Trp Phe Ala Leu Asp Arg Ile Met Leu Val  
65 70 75 80

Arg Leu Leu Met Thr Ala Val Leu Val Leu Leu Phe Ile Ala Ala Phe  
85 90 95

Arg Asn Pro Lys Leu Val Pro Lys Gly Leu Gln Asn Val Ala Glu Tyr  
100 105 110

Ala Leu Asp Phe Val Arg Ile His Ile Ala Glu Asp Ile Leu Gly Lys  
115 120 125

Lys Glu Gly Arg Arg Phe Leu Pro Leu Leu Ala Ala Ile Phe Phe Gly  
130 135 140

Thr Leu Phe Trp Asn Val Ser Thr Ile Ile Pro Ala Leu Asn Ile Ser  
145 150 155 160

Ala Asn Ala Arg Ile Gly Met Pro Ile Val Leu Ala Gly Ala Ala Tyr  
165 170 175

Ile Ala Met Ile Tyr Ala Gly Thr Lys Arg Tyr Gly Phe Gly Lys Tyr  
180 185 190

Val Lys Ser Ser Leu Val Ile Pro Asn Leu Pro Pro Ala Leu His Leu  
195 200 205

Leu Val Val Pro Ile Glu Phe Phe Ser Thr Phe Ile Leu Arg Pro Val  
210 215 220

Thr Leu Ala Ile Arg Leu Met Ala Asn Phe Leu Ala Gly His Ile Ile  
225 230 235 240

Leu Val Leu Leu Tyr Ser Ala Thr Asn Phe Phe Phe Trp Gln Leu Asn  
245 250 255

Gly Trp Thr Ala Met Ser Gly Val Thr Leu Leu Ala Ala Val Leu Phe  
260 265 270

Thr Val Tyr Glu Ile Ile Ile Phe Leu Gln Ala Tyr Ile Phe Ala  
275                    280                    285

Leu Leu Thr Ala Val Tyr Ile Glu Leu Ser Leu His Ala Asp Ser His  
290                    295                    300

<210> 2

<211> 79

<212> PRT

<213> *Corynebacterium ammoniagenes*

<400> 2

Met Asn Asp Ile Ile Leu Ala Gln Ala Thr Glu Thr Ser Phe Asp Gly  
1                    5                    10                    15

Leu Gln Ser Ile Gly Tyr Gly Leu Ala Thr Ile Gly Pro Gly Leu Gly  
20                    25                    30

Ile Gly Ile Leu Val Gly Lys Thr Val Glu Gly Met Ala Arg Gln Pro  
35                    40                    45

Glu Met Ala Gly Gln Leu Arg Thr Thr Met Phe Leu Gly Ile Ala Phe  
50                    55                    60

Val Glu Ala Leu Ala Leu Ile Gly Leu Val Ala Gly Phe Leu Phe  
65                    70                    75

<210> 3

<211> 189

<212> PRT

<213> *Corynebacterium ammoniagenes*

<400> 3

Met Asn Asn Val Phe Tyr Tyr Leu Ala Ala Glu Gly Glu Ser Leu Pro

1                    5                    10                    15

Leu Glu Gly Gly Asn Ser Leu Leu Phe Pro Lys Ser Tyr Asp Ile Val  
20                    25                    30

Trp Ser Leu Ile Pro Phe Leu Ile Ile Leu Ile Val Phe Ala Met Phe  
35                    40                    45

Val Ile Pro Lys Phe Gln Glu Leu Leu Gln Glu Arg Glu Asp Arg Ile  
50                    55                    60

Glu Gly Gly Ile Lys Arg Ala Glu Ala Gln Gln Ala Glu Ala Lys Ala  
65                    70                    75                    80

Ala Leu Glu Lys Tyr Asn Ala Gln Leu Ala Asp Ala Arg Ala Glu Ala  
85                    90                    95

Ala Glu Ile Arg Glu Gln Ala Arg Glu Arg Gly Lys Gln Ile Glu Ala  
100                  105                  110

Glu Ala Lys Thr Gln Ala Glu Glu Ala Arg Arg Ile Val Ala Gly  
115                  120                  125

Gly Glu Lys Gln Leu Glu Ala Ser Arg Ala Gln Val Val Ala Glu Leu  
130                  135                  140

Arg Ser Asp Ile Gly Gln Asn Ser Ile Asn Leu Ala Glu Lys Leu Leu  
145                  150                  155                  160

Gly Gly Glu Leu Ser Glu Ser Thr Lys Gln Ser Ser Thr Ile Asp Asn  
165                  170                  175

Phe Leu Ser Glu Leu Asp Ser Val Ala Ser Ala Gly Lys  
180                  185

<210> 4

<211> 271

<212> PRT

<213> *Corynebacterium ammoniagenes*

<400> 4

Met Lys Ala Ala Ser Arg Glu Ser Leu Ala Ser Ala Thr Glu Ser Leu  
1 5 10 15

Asp Ser Asn Leu Ala Ala Gln Ala Gly Val Ala Val Ser Thr Met Thr  
20 25 30

Gly Met Glu Leu Phe Glu Val Ser Gln Val Leu Gly Asp Asp Arg Glu  
35 40 45

Leu Arg Gly Ala Val Ile Asp Glu Ser Ala Ser Thr Glu Ser Arg Lys  
50 55 60

Lys Leu Val Asn Asp Leu Phe Gly Ala Lys Val Ser Pro Ala Thr Leu  
65 70 75 80

Gln Val Leu Glu Gln Ile Ala Ser Ser Lys Trp Ser Ser Ala Arg Glu  
85 90 95

Met Val Ser Gly Leu Ile Ala Leu Ser Arg Arg Ala Leu Met Arg Gly  
100 105 110

Ala Glu Ser Glu Gly Gln Leu Gly Gln Val Glu Asp Glu Leu Phe Arg  
115 120 125

Leu Ser Arg Ile Leu Asp Arg Glu Gly Glu Leu Thr Gln Leu Leu Ser  
130 135 140

Asp Arg Ala Ala Glu Pro Ala Arg Lys Arg Lys Leu Leu Ala Asp Val  
145 150 155 160

Leu Tyr Gly Lys Val Thr Lys Phe Thr Glu Ala Leu Ala Leu Gln Val  
165 170 175

Ile Asp Arg Pro Glu His Asn Pro Ile Asp Asp Ile Ala Asn Leu Ala  
180 185 190

Ala Glu Ala Ala Gln Leu Gln Gly Arg Thr Val Ala His Val Val Ser  
195 200 205

Ala Gly Glu Leu Asn Glu Gly Gln Gln Ala Val Leu Ala Glu Lys Leu  
210 215 220

Gly Lys Ile Tyr Gly Arg Ala Met Ser Ile His Ser Glu Val Asp Thr  
225 230 235 240

Ser Leu Leu Gly Gly Met Thr Ile Arg Val Gly Asp Glu Val Ile Asp  
245 250 255

Gly Ser Thr Ala Gly Lys Ile Glu Arg Leu Arg Thr Ala Leu Lys  
260 265 270

<210> 5

<211> 546

<212> PRT

<213> Corynebacterium ammoniagenes

<400> 5

Met Ala Glu Leu Thr Ile Ser Ser Asp Glu Ile Arg Ser Ala Ile Ala  
1 5 10 15

Asn Tyr Thr Ser Ser Tyr Ser Ala Glu Ala Ser Arg Glu Glu Val Gly  
20 25 30

Val Val Ile Ser Ala Ala Asp Gly Ile Ala Gln Val Ser Gly Leu Pro  
35 40 45

Ser Val Met Ala Asn Glu Leu Leu Glu Pro Gly Gly Val Ile Gly  
50 55 60

Val Ala Gln Asn Leu Glu Thr Asn Ser Ile Gly Val Val Ile Leu Gly  
65 70 75 80

Asn Tyr Glu Ser Leu Lys Glu Gly Asp Gln Val Lys Arg Thr Gly Glu  
85 90 95

Val Leu Ser Ile Pro Val Gly Glu Glu Phe Leu Gly Arg Val Ile Asn  
100 105 110

Pro Leu Gly Gln Ala Ile Asp Gly Leu Gly Pro Ile Ala Gly Glu Glu  
115 120 125

Asp Arg Val Leu Glu Leu Gln Ala Pro Ser Val Leu Gln Arg Gln Pro  
130 135 140

Val Glu Glu Pro Met Gln Thr Gly Ile Lys Ala Ile Asp Ala Met Thr  
145 150 155 160

Pro Ile Gly Arg Gly Gln Arg Gln Leu Ile Ile Gly Asp Arg Lys Thr  
165 170 175

Gly Lys Thr Ala Val Cys Ile Asp Thr Ile Leu Asn Gln Lys Ala Asn  
180 185 190

Trp Glu Ser Gly Asp Lys Asn Lys Gln Val Arg Cys Ile Tyr Val Ala  
195 200 205

Ile Gly Gln Lys Gly Ser Thr Ile Ala Gly Val Arg Lys Thr Leu Glu  
210 215 220

Glu Gln Gly Ala Leu Glu Tyr Thr Thr Ile Val Ala Ala Pro Ala Ser  
225 230 235 240

Asp Ser Ala Gly Phe Lys Trp Leu Ala Pro Phe Ser Gly Ala Ala Leu  
245 250 255

Gly Gln His Trp Met Tyr Gln Gly Asn His Val Leu Val Ile Tyr Asp  
260 265 270

Asp Leu Thr Lys Gln Ala Glu Ala Tyr Arg Ala Ile Ser Leu Leu Leu  
275 280 285

Arg Arg Pro Pro Gly Arg Glu Ala Tyr Pro Gly Asp Val Phe Tyr Leu  
290 295 300

His Ser Arg Leu Leu Glu Arg Ala Ala Lys Leu Ser Asp Asp Leu Gly  
305 310 315 320

Ala Gly Ser Leu Thr Ala Leu Pro Ile Ile Glu Thr Lys Ala Asn Asp  
325 330 335

Val Ser Ala Phe Ile Pro Thr Asn Val Ile Ser Ile Thr Asp Gly Gln  
340 345 350

Val Phe Leu Glu Ser Asp Leu Phe Asn Gln Gly Val Arg Pro Ala Ile  
355 360 365

Asn Val Gly Val Ser Val Ser Arg Val Gly Gly Ala Ala Gln Thr Lys  
370 375 380

Gly Met Lys Lys Val Ala Gly Asn Leu Arg Leu Asp Leu Ala Ser Tyr  
385 390 395 400

Arg Asp Leu Gln Gly Phe Ala Ala Phe Ala Ser Asp Leu Asp Pro Val  
405 410 415

Ser Lys Ala Gln Leu Glu Arg Gly Glu Arg Leu Val Glu Ile Leu Lys  
420 425 430

Gln Ser Glu Ser Ser Pro Gln Ala Val Glu Tyr Gln Met Val Ser Ile  
435 440 445

Phe Leu Ala Glu Glu Gly Val Phe Asp Val Val Pro Val Glu Asp Val  
450 455 460

Arg Arg Phe Glu Ala Asp Val Gln Glu Tyr Leu Gln Gln Asn Thr Pro  
465 470 475 480

Glu Val Tyr Glu Gln Ile Ala Gly Gly Lys Ala Phe Thr Asp Glu Ser  
485 490 495

Lys Glu Ala Leu Leu Ala Ala Ala Lys Asp Phe Thr Pro Ser Phe Arg  
500 505 510

Thr Thr Glu Gly His Asn Leu Gly Thr Glu Ala Pro Val Asp Pro Leu  
515 520 525

Ala Glu Glu Glu Val Lys Lys Thr Glu Val Thr Val Ser Arg Lys Ser  
530 535 540

Ala Lys  
545

<210> 6  
<211> 327  
<212> PRT  
<213> Corynebacterium ammoniagenes

<400> 6  
Met Ala Asn Leu Arg Glu Leu Arg Asp Arg Ile Arg Ser Val Asn Ser  
1 5 10 15

Thr Lys Lys Ile Thr Lys Ala Gln Glu Leu Ile Ala Thr Ser Arg Ile

	20	25	30
Thr Lys Ala Gln Ala Lys Val Asp Ala Ala Ala Pro Tyr Ala His Glu			
	35	40	45
Met Ser Asn Met Met Asp Arg Leu Ala Ser Ala Ser Ser Leu Glu His			
	50	55	60
Pro Met Leu Arg His Arg Glu Asn Gly Lys Val Ala Ala Val Leu Val			
	65	70	75
			80
Val Ser Ser Asp Arg Gly Met Cys Gly Gly Tyr Asn Asn Asn Val Phe			
	85	90	95
Lys Lys Ala Ala Glu Leu Glu Gly Leu Leu Arg Gly Gln Gly Phe Asp			
	100	105	110
Val Val Arg Tyr Val Thr Gly Ser Lys Gly Val Gly Tyr Tyr Asn Phe			
	115	120	125
Arg Glu Lys Glu Val Val Gly Ala Trp Thr Gly Phe Ser Gln Asp Pro			
	130	135	140
Ser Trp Glu Gly Thr His Asp Val Arg His His Leu Val Asp Gly Phe			
	145	150	155
			160
Ile Ala Gly Ser Glu Gly Thr Thr Pro Ala Arg Gln Gly Val Asn Thr			
	165	170	175
Glu Asp Gln Thr Val Arg Gly Phe Asp Gln Val His Val Val Tyr Thr			
	180	185	190
Glu Phe Glu Ser Met Leu Val Gln Thr Pro Arg Ala His Gln Leu Leu			
	195	200	205
Pro Ile Glu Pro Val Ile Lys Glu Glu Glu Leu His Leu Gly Asp Ser			

210

215

220

Ala Leu Glu Ala Asn Pro Asp Ala Gln Gly Leu Ser Ala Asp Tyr Glu

225 230 235 240

Phe Glu Pro Asp Ala Asp Thr Leu Leu Ser Ala Leu Leu Pro Gln Tyr

245 250 255

Val Ser Arg Ile Leu Phe Ser Met Phe Leu Glu Ala Ser Ala Ser Glu

260 265 270

Ser Ala Ala Arg Arg Thr Ala Met Lys Ala Ala Thr Asp Asn Ala Asn

275 280 285

Asp Leu Val Thr Asp Leu Ser Arg Val Ala Asn Gln Ala Arg Gln Ala

290 295 300

Gln Ile Thr Gln Glu Ile Thr Glu Ile Val Gly Gly Ala Gly Ala Leu

305 310 315 320

Ala Glu Ser Ala Glu Ser Asp

325

<210> 7

<211> 481

<212> PRT

<213> *Corynebacterium ammoniagenes*

<400> 7

Met Thr Thr Ala Leu His Glu Gln Asn Thr Gln Glu Ser Ala Ile Ala

1 5 10 15

Gly Arg Val Val Arg Val Ile Gly Pro Val Val Asp Val Glu Phe Pro

20 25 30

Arg Gly Gly Leu Pro Ala Leu Tyr Asn Ala Leu Thr Val Glu Ile Asn  
35 40 45

Leu Glu Ser Val Ala Arg Thr Ile Thr Leu Glu Val Ala Gln His Leu  
50 55 60

Gly Asp Asn Leu Val Arg Thr Val Ser Met Ala Pro Thr Asp Gly Leu  
65 70 75 80

Val Arg Arg Ala Ala Val Thr Asp Thr Glu Ala Pro Ile Ser Val Pro  
85 90 95

Val Gly Asp Val Val Lys Gly His Val Phe Asn Ala Leu Gly Asp Cys  
100 105 110

Leu Asp Glu Pro Gly Leu Gly Arg Asp Gly Glu Gln Trp Gly Ile His  
115 120 125

Arg Glu Pro Pro Ala Phe Asp Gln Leu Glu Gly Lys Thr Glu Ile Leu  
130 135 140

Glu Thr Gly Ile Lys Val Ile Asp Leu Leu Thr Pro Tyr Val Lys Gly  
145 150 155 160

Gly Lys Ile Gly Leu Phe Gly Gly Ala Gly Val Gly Lys Thr Val Leu  
165 170 175

Ile Gln Glu Met Ile Thr Arg Ile Ala Arg Glu Phe Ser Gly Thr Ser  
180 185 190

Val Phe Ala Gly Val Gly Glu Arg Thr Arg Glu Gly Thr Asp Leu Phe  
195 200 205

Leu Glu Met Glu Glu Met Gly Val Leu Gln Asp Thr Ala Leu Val Phe  
210 215 220

Gly Gln Met Asp Glu Pro Pro Gly Val Arg Met Arg Val Ala Leu Ser  
225 230 235 240

Gly Leu Thr Met Ala Glu Tyr Phe Arg Asp Val Gln Asn Gln Asp Val  
245 250 255

Leu Leu Phe Ile Asp Asn Ile Phe Arg Phe Thr Gln Ala Gly Ser Glu  
260 265 270

Val Ser Thr Leu Leu Gly Arg Met Pro Ser Ala Val Gly Tyr Gln Pro  
275 280 285

Thr Leu Ala Asp Glu Met Gly Val Leu Gln Glu Arg Ile Thr Ser Thr  
290 295 300

Lys Gly Lys Ser Ile Thr Ser Leu Gln Ala Val Tyr Val Pro Ala Asp  
305 310 315 320

Asp Tyr Thr Asp Pro Ala Pro Ala Thr Thr Phe Ala His Leu Asp Ala  
325 330 335

Thr Thr Glu Leu Asp Arg Ala Ile Ala Ser Lys Gly Ile Tyr Pro Ala  
340 345 350

Val Asn Pro Leu Ser Ser Thr Ser Arg Ile Leu Glu Pro Ser Ile Val  
355 360 365

Gly Glu Arg His Tyr Ala Val Ala Gln Arg Val Ile Asn Ile Leu Gln  
370 375 380

Lys Asn Lys Glu Leu Gln Asp Ile Ile Ala Ile Leu Gly Met Asp Glu  
385 390 395 400

Leu Ser Glu Glu Asp Lys Ile Thr Val Gln Arg Ala Arg Arg Ile Glu  
405 410 415

Arg Phe Leu Gly Gln Asn Phe Phe Val Ala Glu Lys Phe Thr Gly Leu  
420 425 430

Pro Gly Ser Tyr Val Pro Leu Ala Asp Thr Ile Asp Ala Phe Glu Arg  
435 440 445

Ile Cys Asn Gly Glu Phe Asp His Tyr Pro Glu Gln Ala Phe Asn Gly  
450 455 460

Leu Gly Gly Leu Asp Asp Val Glu Ala Ala Tyr Lys Lys Leu Thr Glu  
465 470 475 480

Lys

<210> 8

<211> 123

<212> PRT

<213> Corynebacterium ammoniagenes

<400> 8

Met Ala Asp Ile Thr Val Glu Leu Val Ser Val Glu Arg Met Leu Trp  
1 5 10 15

Ser Gly Lys Ala Thr Ile Ile Ser Ala Glu Thr Thr Glu Gly Glu Ile  
20 25 30

Gly Val Leu Pro Gly His Glu Pro Leu Leu Gly Gln Leu Ala Glu Asn  
35 40 45

Gly Val Val Thr Phe Arg Pro Val Asp Gly Asp Arg Lys Val Ala Ala  
50 55 60

Val Gln Gly Gly Phe Leu Ser Val Ser Thr Glu Lys Ile Thr Val Leu  
65 70 75 80

Ala Asp Trp Ala Val Trp Ala Asp Glu Val Asn Glu Ser Gln Ala Gln  
85 90 95

Glu Asp Ala Leu Ser Ser Asp Glu Leu Val Ser Ser Arg Gly Gln Ala  
100 105 110

Ala Leu Arg Ala Leu Ala Arg Ser Arg Glu Ser  
115 120

<210> 9

<211> 912

<212> DNA

<213> Corynebacterium ammoniagenes

<400> 9

atgtgcgacg gagtccgtag ctgtgacaga gagtttgaga cgtccatcgc accgtacgac 60

gtcgacaatc gtacggcccg aacacgggag agaacgctga gcgttacaac attggccatg 120

aagggttagct tccacgcgcc cgaactggac ccagaatttt tcccgggca atattacggc 180

gacatcctgt tcgacgatgt gttggcgga tggttcgcac ttgatcgcat catgctggtt 240

cgtctgttga tgaccgcgt cttggcgctt ttatatttgc cagcatttgc gaacctaaag 300

ctggttccata agggactaca gaacgtcgca gaatacgcgt tagatttcgt ccgaattcac 360

attgctgagg acatcctggg caagaaggag ggtcgctcgct tcctaccgtt gctggcggt 420

atcttcttcg gcaccctttt ctggAACGTC tccacgatta ttccggcaact gaacatctcc 480

gcaaACGCTC gtattggcat gcctattgtc ttggctggcg cagcgtatat cgcaatgatt 540

tacgcaggca ccaAGCGCTA tggcttcgtt aagtacgtca agtcgtcggtt gtttattcct 600

aaccttccac cggtttgca cttgctggc gttccaattt agttttctc gacccatc 660

ttgcgtcccg tcactctggc aattcgtctt atggcgaact tccttgcgg ccacatcatt 720

ttggttctgc tgtactctgc cacgaacttc ttcttctggc agctcaacgg ctggacagcg 780

atgtccggtg tgaccctgct cgccagggtt ctgtttacgg tctacgagat catcatcatc 840

ttcctgcagg catacatctt tgctctgctg acggcggtgt acatcgagtt gtcacttcac 900

gcagactcgc ac 912.

<210> 10

<211> 237

<212> DNA

<213> Corynebacterium ammoniagenes

<400> 10

atgaacgaca tcatcttggc tcaggcaacc gagacctcct tcgatggcct tcagtccatc 60

ggctacggcc ttgcaaccat cggccctggc ttgggtattt gtatcctcgt cggcaagacc 120

gttgaggca tggcacgtca gcctgagatg gctggccagc tgcgtaccac catgttcctg 180

ggtatcgccct tcgttgggc tcttgcactt atcggcctgg ttgcaggcctt cctgttc 237

<210> 11

<211> 567

<212> DNA

<213> Corynebacterium ammoniagenes

<400> 11

atgaacaacg tctttacta tcttgcagcg gaaggagatg cccttccact ggaagggtggc 60

aactcccttc tgttcccaa gagctatgac atcgtctggc ctctgatccc gttcttaatc 120  
atccttattg tcttcgaat gtttgtcatt ccgaagttcc aggaactgtt gcaagagcgt 180  
gaagaccgga ttgagggcgg catcaagcgc gctgaagccc aacaggcaga agcaaaggcc 240  
gcacttgaga agtacaacgc acagcttagct gacgctcgcg cagaggcagc taaaatccgt 300  
gagcaggcgc gtgagcgcgg caagcagatt gaagcagagg caaagaccca ggcagaggaa 360  
gaagcacgcc gtatcgctgc aggtggcgaa aaacagctt aagcttcccg cgacacaggta 420  
gttgctgaac tgcgttccga tatcgacag aactccatca acttggttga gaagctgctc 480  
ggcggtaac tctctgagtc caccaaggcag tcttcaacca ttgataactt cctgtccgag 540  
ctcgactctg tggcatcgcc cgaaag 567

<210> 12

<211> 813

<212> DNA

<213> *Corynebacterium ammoniagenes*

<400> 12

atgaaggcag ctagccgcga atcgctcgca tccgctaccg agtcgctgga ttccaatctg 60

gcagctcaag caggtgttagc agtgcaccatg accggca tggaactgtt cgaggttcc 120

caagtattgg gtgatgaccg cgaactccgt ggagcagtca ttgatgaatc tgcttccact 180

gaatccgcga agaagctcgtaatgatctc ttccgtgccaa aagtttctcc tgctacctt 240

caggttctgg aacagattgc atcgatcgaa tggcgagcg cccgcgagat ggttccggaa 300

ctgatcgctc tttcacgtcg tgctttgatc cgccggcgcag aaagcgaagg acaacttagga 360

caggtcgaag atgaactctt ccgcttgtcc cggatcctgg accgcgaagg cgaactcacc 420  
cagctgctt ctgaccgagc tgcagaacct gcgcgtaagc gcaagttgct ggcatatgtg 480  
ctttacggaa aggtcaccaa attcaactgag gcgcttgcgc tgcaggtgat tgaccgcct 540  
gagcacaatc ccattgatga cattgcgaat ctggcggctg aagcagcaca gttcagggt 600  
cgcaactgttg cgacgttgt tagtgcgggt gaactcaatg aaggccagca ggcagtactc 660  
gccgagaagc tggcaagat ttatggcgt gcatgtcca tccactctga gttgacacc 720  
agcctcctcg gtggtatgac aatccgcgt a ggcgtatgaa ttattgacgg ttctaccgca 780  
ggcaaaattg agccgcctgcg taccgctttg aag 813

<210> 13  
<211> 1638  
<212> DNA  
<213> *Corynebacterium ammoniagenes*

<400> 13

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agctactccg cggaggcctc ccgtgaggag gtcggcgtgg tcatttcggc agctgacggt 120  
attgcacagg tttctgggct accttcagtt atggcgaatg agctgctcga gttccctggc 180  
ggcgtaatcg gcgtcgacaca aaaccttgaa accaactcca ttggcggtt tattcttggt 240  
aactacgagt ccctcaaaga aggcgaccaa gttaagcgaa ctggcgaagt tctctccatc 300  
ccagtggtg aagagttccct cggccgcgtt attaaccat tgggtcaggc aattgacggc 360

ctggcccaa tcgctggcga agaggaccgc gtcctcgagc tgcaggcacc ttccgtgtt 420  
cagcgtcagc cagttgaaga gccaatgcag accggcatca aggctattga tgctatgacc 480  
ccaatcggtc gcggtcagcg tcagctcatc attgggtgacc gtaagactgg taaaaccgca 540  
gtctgcatcg acaccatcct taaccagaag gctaactggg aatccggcga caagaacaag 600  
caagttcggtt gtatctacgt cgctatttgtt cagaaggcgt ccaccatcgcc tggtgtccgc 660  
aagaccctcg aagagcaggg cgctctggag tacaccacca tcgtggctgc tcctgcttct 720  
gactccgcgg gcttcaagtg gttggcacca ttctccggtg ctgctcttgg tcagcactgg 780  
atgtaccagg gcaaccacgt cttggtcatc tatgatgact tgaccaagca ggctgaggct 840  
taccgtgcga tttccctgtt gctgcgtcgc ccggccggcc gcgaagctta cccaggtgac 900  
gttttctact tgcactcccg tctgctggag cgtgctgcga agctctccga tgatttgggt 960  
gcaggttctt tgaccgcact gccaaattatt gaaaccaagg cgaatgacgt gtctgcgttc 1020  
attccaaacca acgttatttc cattaccgac ggccaggctt tcctggagtc cgacctgttc 1080  
aaccaaggcg tccgtccggc aattaacgtc ggtgtgtcgg tttccctgtt tggtggcgct 1140  
gctcagacca aggttatgaa gaaggttgca ggtaacctgc gtcttgacct cgcttctac 1200  
cgtgatctgc agggcttgc tgccttcgct tctgacttgg acccagtgtc caaggcccag 1260  
ctttagcgcg gtgagcgtct ggtttagatc ctgaaggcgt ctgagtc tccctcaggca 1320  
gtcgagtaac agatggtttc catcttcttg gctgaagaag gcgtttcga cgtcggttct 1380  
gtcgaagatg ttctcgctt tgaggctgac gttcaggaaat acctgcagca gaacacccca 1440

gaggtttacg agcagattgc cggcggtaa gcatttaccg acgagtccaa ggaagccctg 1500  
ttggctgcag ctaaggactt cactccttcc ttccgcacca ccgagggcca caacttggc 1560  
actgaagctc cagttgatcc tttggctgaa gaagaagtca agaagactga agtcaccgtc 1620  
tcccgtaaat cggttaag 1638

<210> 14

<211> 981

<212> DNA

<213> Corynebacterium ammoniagenes

<400> 14

atggcaaatac ttgcgaaatt gcgcgaccgt atccgtccg tgaactcgac caagaagatc 60

accaaggcgc aggagctgat tgcaacttct cgcattacca aggcgcaagc caaggttgat 120

gcagcagcac cgtacgcaca cgagatgtcg aacatgatgg accgtcttgc atcggctagc 180

tctttggagc accaatgtct gegeccacccgt gaaaacggca aagttgcage cgtactcg 240

gtctttctg acccggttat gtgtggtgac tacaacaaca acgtctttaa gaaggctgct 300

gagctcgaag gactcctcg cggtaaggc ttgcacgttgc tccgctacgt aaccggtagc 360

aagggcgtcg gctactacaa cttccgtgag aaggaagttg tggcgccgtg gactggctt 420

tctcaggatc cgtcctggaa aggcaactcac gacgttcgtc accacttggt tgacggcttc 480

attgctggct ccgaaggtaac aactccggcc cgtcaggcg tgaacaccga agaccaaacg 540

gtacgtggtt tcgaccaggtaac acacgttgc tacaccgagt tcgaatccat gctggttcag 600

actccacgtc ctcaccaggtaat gttgccgatt gaaccggtaa ttaaagaaga ggaacttcac 660

ctggcgact cggcgctaga agccaaccct gatgctcagg gcctgtctgc tgactacgag 720  
ttttagccgg atgcagatac tttgctctcg gcacttctgc cgcaagtatgt atcacgtatc 780  
ctttctcga ttttcttgaa ggcttcggct tctgagtcgg cagctcgtcg aactgcaatg 840  
aaggctgcga ctgacaacgc taatgacttg gtaaccgact tgtctcgtgt tgctaaccag 900  
gctcgtcagg cgcaattac ccaggaaatc acagaaatcg tcgggtggcgc tggcgcgctc 960  
gccgaaaagcg cagaaaagtga c 981

<210> 15

<211> 1443

<212> DNA

<213> Corynebacterium ammoniagenes

<400> 15

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<213> Corynebacterium ammoniagenes

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<213> Corynebacterium ammoniagenes

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